

The only electrode material that is provided in Reinberg is the titanium nitride layer. The carbon layer is merely an underlying layer that is used as a barrier to prevent migration to the underlying substrate.

Thus, Reinberg does not teach covering the lower electrode with a protective layer. He teaches underlying the electrode material with a barrier layer. Therefore, reconsideration of the rejection of claim 1 is respectfully requested.

With respect to claim 10, material is cited in column 7 that seems to have nothing to do with the formation of the electrode 56. It is simply not explained how the electrode material 56 may be formed. It is not shown as separate layers and it is not explained how the resulting electrode is formed. Therefore, claim 10 cannot be anticipated by Reinberg.


The new claims simply further define the present invention. For example, claims 31 and 38 require that the protective layer and the electrode be formed in the same deposition chamber. Clearly no such teaching is anywhere found in Reinberg.

Further, some of the newly added dependent claims call for specific types of protective layers, those materials being insulators or even silicon nitride. Clearly, the only thing that the Examiner could claim as an overlying layer is the layer of titanium nitride that plainly is the electrode. But certainly it is not an insulator.

In view of these remarks, the application is now in condition for allowance and the Examiner's prompt action in accordance therewith is respectfully requested.

Respectfully submitted,

Date: March 13, 2003



Timothy M. Trop, Reg. No. 28,994
TROP, PRUNER & HU, P.C.
8554 Katy Freeway, Ste. 100
Houston, TX 77024
713/468-8880 [Phone]
713/468-8883 [Fax]



APPENDIX

Please cancel claims 11-30.

Please add the following new claims 31 *et seq.*.

31 (New). The method of claim 1 including forming the lower electrode and covering the lower electrode with a protective layer in the same chamber.

32 (New). The method of claim 31 including depositing the lower electrode and the protective layer in the same deposition chamber.

33 (New). The method of claim 32 including depositing the electrode and protective layer in the same deposition chamber without venting back to atmosphere.

34 (New). The method of claim 1 including forming the protective layer of an insulator.

35 (New). The method of claim 34 including forming the protective layer of a material in the form of silicon nitride.

36 (New). The method of claim 35 including forming the silicon nitride in the form of Si_3N_4 .

37 (New). A method comprising:
forming a protective layer over a lower electrode of a phase change memory.

38 (New). The method of claim 37 including forming the lower electrode and covering the lower electrode with a protective layer in the same chamber.

39 (New). The method of claim 38 including depositing the lower electrode and the protective layer in the same deposition chamber.

40 (New). The method of claim 39 including depositing the electrode and protective layer in the same deposition chamber without venting back to atmosphere.

41 (New). The method of claim 37 including forming the protective layer of an insulator.

42 (New). The method of claim 41 including forming the protective layer of a material in the form of silicon nitride.

43 (New). The method of claim 42 including forming the silicon nitride in the form of Si_3N_4 .

44 (New). A method comprising:
forming an insulating protective layer over a conductive lower electrode of a phase change memory.

45 (New). The method of claim 44 including forming the lower electrode and covering the lower electrode with a protective layer in the same chamber.

46 (New). The method of claim 45 including depositing the lower electrode and the protective layer in the same deposition chamber.

47 (New). The method of claim 46 including depositing the electrode and protective layer in the same deposition chamber without venting back to atmosphere.

48 (New). The method of claim 44 including forming the protective layer of an insulator.

49 (New). The method of claim 48 including forming the protective layer of a material in the form of silicon nitride.

50 (New). The method of claim 49 including forming the silicon nitride in the form of Si_3N_4 .